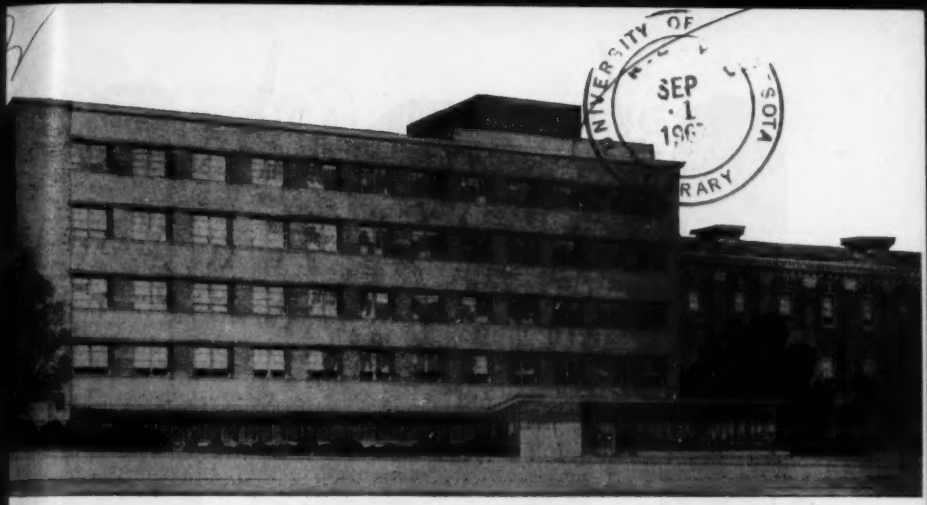

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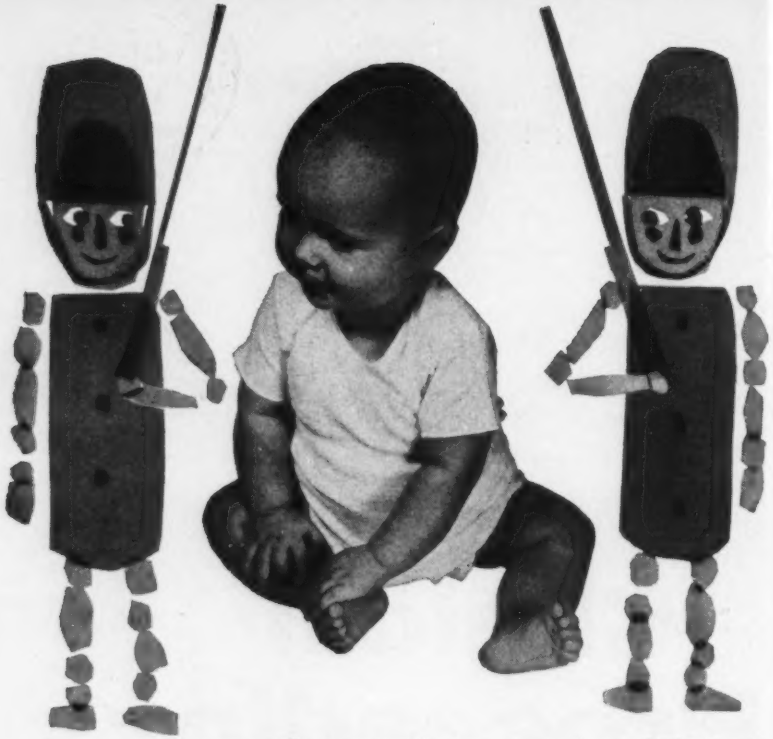

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EMOTIONAL FACTORS ENCOUNTERED DURING THE TREATMENT OF ECZEMA IN AN INFANT

WEEKLY CLINICAL CONFERENCE

Reginald S. Lourie, M.D.*
Naomi Kanof, M.D.†
William A. Howard, M.D.‡
Emma Layman, Ph.D.§
Clifford A. Webb, M.D.¶
Stanley Blumenthal, M.D.‖

It is with considerable hesitancy that we open the subject of emotional components in infantile eczema because we are very admittedly on speculative grounds. However, at least we will be able to see from this case that the skin is important in the emotional economy of the infant.

CASE REPORT

The first Children's Hospital admission of this colored girl was on December 30, 1955 when she was 7 months old. The chief complaint at that time was generalized eczema with onset at 3 or 4 weeks of age. Since onset she was noted to scratch herself and cry very frequently. A hypoallergenic diet which was prescribed seemed to be of definite value; however, in spite of intermittent periods of improvement, her skin never cleared completely. She was hospitalized at another hospital with this complaint at 4 months of age, and was discharged after one month, somewhat improved. Growth and weight gain were normal. She recognized her mother at 4 months, was almost sitting alone at 6 months, and at that time was laughing and interested in everyone. At 2 or 3 months, however, she began head rolling.

The patient's mother was 26 years old. There was a strong maternal family history of allergy; her father, brother and sister had asthma. The mother was described as a passive woman who stated she had no worries. Her time was divided between doing housework and listening to the radio or watching television, and she very often left the patient alone in her crib. The father was 34. Most of his time was spent at his regular job or at extra jobs. As a result, very little of his time was spent with his family. One sibling, a 5 year old sister, had had eczema since she was 3 months old, but it had been fairly well controlled. A 4 year old brother was in good health. Social

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Service report indicated that the family lived in a house that was in poor physical condition. A bathroom window was broken the previous fall and was left unrepaired throughout the entire winter.

During her hospital stay, the patient was treated with hormones, several antibiotics and antihistaminics. A variety of ointments, about eight in all, were used during this time. The condition of her skin improved. Because of head rolling, rocking movements, lack of interest in people and scratching, she was referred to the Psychiatric Service, and psychological evaluation was begun before she was discharged. This showed that she was retarded in all aspects of development, and was functioning on the level of a child 3 months of age. The expression on her face was one of impassiveness. She would not reach for things and if a rattle were placed in her hand, she would make only slight movement. Her behavior was suggestive of depression, with no evidence of social awareness. Because of the improvement of her skin lesions, the patient was sent home, and psychiatric therapy begun there. The mother's description of the child after 2 months of hospitalization was: "she seems 'turned over' and must start to learn everything again. She does not recognize me, does not laugh, and has rolling and rocking movements of her head every 15 or 20 minutes. She is scratching herself continuously."

The patient was hospitalized at Children's Hospital for the second time on February 21, 1956 because of secondary infection of eczematoid lesions on her arms. During this hospitalization she was intensely withdrawn, would not respond to people or stimulation, and appeared interested only in continuous rocking movements and scratching. She would even scratch the hands of anyone who held her hands. Psychiatric therapy was begun immediately with the aims of getting her attention away from her skin and building a better relationship with her mother. When she was discharged on March 17, 1956 her skin lesions were much improved. She would follow objects, with her eyes, smile at those caring for her and, when cotton balls were placed in her hands, she would squeeze them slightly instead of scratching.

On April 11, 1956 she was seen in the Out Patient Department and her mother reported great improvement. She continued to improve until April 22, 1956 when she was admitted with acute pneumococcal meningitis and died the next day.

DISCUSSION

Dr. Lourie:

Dr. Kanof will discuss this case from the dermatologic viewpoint.

Dr. Kanof:

In considering the role of the psyche in infantile eczema, and with this particular case in mind, two major aspects present themselves: first the psychic mechanism, if any, of the production of atopic dermatitis; and second, the effect on the psyche by the disease, atopic dermatitis.

We do not at present know the *cause* of this disease. While it is completely possible that future investigation will reveal a psychogenic causation of atopic dermatitis, it is much more likely that the disease will be found to be caused by a combination of circumstances. Just as we no longer hold the view that the allergic mechanism is the factor in atopy, so too will the psychogenic mechanism probably be found to be only one of a

combination of causes. Furthermore, it may well be that each individual will have a varying quantity of contributing factors, the allergic, the psychogenic, the influence of climate (barometric pressure), and other influences both environmental and hereditary.

If now, one considers the *effect* that this disease has on the psyche, one has a practical approach to the treatment of the disease. The effect of an itching and sometimes painful eruption on the psyche of a small infant unable to evaluate, much less cope with, these harassing symptoms must be very large indeed. The persistent itching and the orgasmal crisis of itching not only are in themselves disagreeable but also produce fatigue and even exhaustion, with their consequent disastrous effects. These are the symptoms which are likely to be met in most instances and which should be attended to first. In addition to the primary disagreeable symptoms inherent in this disease, there are the effects on the patient's surroundings. The parents are, of course, distressed at seeing their child in great discomfort, as well as distressed by the messiness of handling a child painted up or greased up at a time when, without this, the whole aspect would be one of great esthetic joy. Compounded upon all this unpleasantness is a great need on the parents' part to place blame if not on an inheritance then at least on food and environment. In this they have the encouragement of the dermatologist, the allergist, and the pediatrician in their desire to elucidate the immediately provocative causes of the eruption. Even the smallest infant with normal intelligence quickly recognizes his dominance of the situation and avails himself of every opportunity to indicate displeasure by rejecting what he does not want. Thus, while it has often been demonstrated that a child will reject foods to which he is allergic, it is also possible for the patient to learn quickly to reject what is simply unpleasant for him for purposes of gaining more and more attention.

It therefore becomes necessary because of the heaping up of psychic influences, whether cause or effect, not only to relieve the discomfort but also to acknowledge the presence of this discomfort. With this in mind, it becomes apparent that *one should not restrain even the smallest infant from scratching*. The fingernails should be cut so that the least damage is done, the hands covered so that there is rubbing instead of scratching and suitable chemotherapy instituted for relief of the itching.

The allergenic aspects of this disease have been explored extensively and have probably in the past been overemphasized. It is certainly necessary at times to do either direct skin testing or passive transfer tests. Often, of course, this is done to reassure the parents that everything that can be done is being done. The puzzling aspect of allergy-testing in this disease has always been that though an urtica can be produced to a substance to which the patient is allegedly sensitive, no urtica has ever developed spon-

taneously on the skin. Skin testing has been very useful from an academic point of view and has revealed the relative allergenicity of the various substances tested. However, in an individual patient the most that a skin test can tell us is that the patient's skin has at that moment reacted to that substance in a manner which bespeaks the patient's allergy to that substance but which does not necessarily reveal his clinical response to it. In the young infant it is apparent that there are few allergenic exposures other than environment; skin testing, therefore, would be an almost useless tool, and the clinical test of trial and error with foods, a much more fruitful approach. I will not go further into the merits and the pitfalls of skin testing in atopic dermatitis except to say that it is at times an extremely valuable adjunct to investigation.

The psychiatric approach to therapy is as useful in this disease as in any other disease process and probably more useful than in many. It is very important to remember that we have here a disease that is doomed to get well, a statement which can be made about almost no other disease except youth. One does not see atopic dermatitis in people past 35 or 40 years of age. If one can instill in the patient and/or the parents confidence in the fact that eventual complete recovery is inevitable, with that sort of homespun psychotherapy one can go on to more complex aspects of psychotherapy as the patient's needs warrant. Most important, one must not overlook chemotherapy and an awareness of the child's dermatologic needs both so far as the discomfort of itching and the discomfort of looking so much worse than his neighbor.

Dr. Lourie:

Before we begin to collect some opinions and critical thinking on this matter, I thought maybe we could describe what happened with this case. When the Department of Psychiatry was asked to see this child, it was not on the basis of the eczema but on the basis of her total adjustment, because it was quite obvious that this child had regressed considerably even in behavioral development. The regression from the developmental status which she had achieved was apparent particularly to the mother who noticed that the baby had given up sitting and trying to stand, and was also turning away from people. This was the most marked aspect of this child's functioning when we saw her. In fact, there was evident what has been described as a "depression-withdrawal reaction". This was at the same time accompanied by a greater concentration on her own body, which took the form of rocking and head rolling, but also involved scratching. These were much more preferable to her than people. So the job we were faced with in dealing with this youngster was how could we sell people back to her.

I think the first person on our staff who saw her was Dr. Layman.

Dr. Layman:

The essential results of the examination have already been reviewed for you, but I might expand these remarks a little bit. When I saw the baby she was just over seven months old. She had for some time been having her hands in mitts, and she had them in mitts at the time I saw her. We removed the mitts from her hands, and she immediately began scratching her head and body and remained preoccupied with this throughout the session. However, an important thing which was noticed was that if something more was put in her hands, she would stop the scratching. As was indicated, her developmental level averaged around 3½ months. However, on the Gesell schedules there was quite a wide range in her developmental level in different areas. For instance, in person-social development she was at 8 weeks of age, and in motor development at 16 weeks of age. Even had we not had the history of this child indicating that there had been some regression in developmental level, the discrepancy in different aspects of development would suggest that this child did have greater potentialities for development than was indicated at this time.

When I saw her, the questions which came to my mind were, "Is this a child who is mentally retarded? Is this a child who has withdrawn from people and from the world because of her need to relieve her physical discomfort? Or is this a child who has become dissatisfied with people because of some factor in the mother-child relationship?" Looking at the history and considering the developmental pattern, I decided that very probably this was not a child who, in terms of potentiality, would be considered a mentally retarded child. I did raise the question of the possibility that this might be a child who, because of the eczema, had needed a type of physical care from the mother which had resulted in a distorted type of mother-child relationship. If the mother-child relationship were related to the withdrawn, depressed pattern she presented, we might consider the possibility that this was secondary to the physical problem involved in this particular case.

I mentioned having noticed the fact that the baby would stop scratching when we put something in her hand. This suggested to us the possibility that her attention could be directed away from her body and away from her concern with stimulation of her skin, and that this might be utilized therapeutically in seeing if we could get her once more interested in the social environment instead of being preoccupied only with her own body.

Dr. Lourie:

When we added up all the impressions collected from all sides, it turned out that this was a child who had emphasis placed on her skin both as a form of pain and as a form of pleasure. It was the displeasure, (the pain)

that had been sufficiently great so that the child came to feel that she could not trust other people. How could this be when it was the child herself who was itching and scratching? Maybe we could understand this from the concept, as we know it, of the way a child feels about other people at this age. To start with, the baby is not really part of somebody when it is a newborn. It is operating on a tangent with its mother, not really part of her. It sleeps up to 20 hours a day, and at this point is only interested in itself. The next step occurs when the child becomes aware, through development of perception and through physical contact, very often via skin stimulation, that there is a person attached to the breast or the bottle. There then gets to be an attachment to that person so that the baby thinks of itself not as an individual, but as part of another person. Whatever happens to the baby is in its mind happening to the mother as well. The baby seems to react as though anything good that happens is part of itself and the bad or painful things that happen are pushed onto the extension of itself that is the mother. One can see this more clearly when children are old enough to talk. As the 18 month old baby falls 20 feet away from you it may get up and glare at you, and ask, "why did you push me?" The behavior of babies, as it has been studied, points to this as a most important phase which is accomplished somewhere between 3 and 6 months of age. Where there gets to be too much discomfort to being part of the mother, the easiest step for the baby is to go back to the stage where it is not part of anybody, where it is on its own.

This is a simple step in the infant; where it is a most dramatic step is in the adult, where anxiety gets too great and we have a psychosis, and the really deteriorated, psychotic individual is actually regressing back to this stage. Interestingly, when adults regress back to this stage in which they are not related to another person, they redevelop the infantile grasping and sucking reflexes as part of the regression. What had happened to this baby was that she had regressed back to this stage of not being part of anyone. In order to help her to be willing to trust a relationship with another person, we had to do something about this question of pain that she was inflicting on her own body. The itching was apparently intolerable, and even without the opportunity to use her hands she could scratch the lesions on her head and back by means of head rolling.

From the psychological study and some of the other observations that were made, we began to have clues as to what could be an approach to helping her to trust other people. It occurred to the staff that if she would scratch someone else when she finally decided to let herself be close to somebody else, this might be one solution. Although somebody could not be holding her all the time, these movements with her hands gave us another clue. We worked out ways of keeping her hands busy with things in the

crib so that she would constantly be touching and manipulating. Also, a foam rubber pad was found which could be strapped to her hand. She could scratch this when she wanted to scratch. This made a considerable amount of difference in the way the child began to feel about people. This, in conjunction with providing an opportunity for other people to reach out to her such as putting her right next to her nurse's desk and having people talking to her all the time, gradually built up her trust again. It turned out to be a sufficiently useful effective approach so that when the child went home we used the visiting nurses to maintain contact with the family and help them in handling the baby in the same patterns as in the hospital. It certainly seemed that progress was being made until the onset of the unfortunate events that led to her death.

I would like to take a few minutes to raise some basic questions about the role of the skin in the infant. The skin, in one way that we understand it, is looked on as another organ of the body. It has very definite functions as an organ of expression as well as what we think of as usual skin functions, such as, perception, temperature regulation, and tactile uses. In terms of expression we are very familiar with the blushing, paleness, redness, and response to anger of the skin. The pleasurable aspects of the skin and its use by the individual in relation to other people is also something that we do not have to go into in any great detail because it is so well known. It is the agent by which contact is made with other people and with the environment, as well as being in a sense a physical separation, a barrier.

The child's experimenting with its skin begins at the point where it can use its hands on a voluntary basis. Thus we see repetitive touching and stroking when the child first is able to control its hands. The skin represents, then, what is a phase of development. In psychological literature we read about oral stages, anal stages, and genital stages. However, there are multiple stages in which the interest, or the focus of the individual is on a part of the body. There are a number of stages going on concurrently, and this stage of experimenting with the skin is the earliest. What happens to the individual in its living experience at this point very often can focus its thinking on the skin, either in a too pleasurable way or as a basis for displeasure resulting from frustration.

What happens to the child with eczema? Let us start with the very controversial point of what caused the atopic lesion. That there are large allergic components we are convinced. These children come from families where there are allergic diatheses. In cases like this child when in the hospital, we are concerned with and we are asked to do something about, not the origin of the lesion, but what grows up on top of it. I think we can see from this instance that what grew up on top of it was depression, withdrawal, and avoidance of people. In other words, may we state this as a

basic tenet: Once a symptom, once a lesion, or other experience related to the skin is established, it can act then as a focal point for the convergence of other disturbances. It may be used in other ways secondarily. It takes on a psychological value, but it has to be established first via the allergic episode.

We have no definite knowledge of what established it, but once the lesion is established, I think that we need to be concerned with how it is handled. What will it lead to? We are convinced of this by following cases as well as by reading back into adult cases of what happened in these early years. We need to be concerned about the neurodermatitis pattern that can develop. We need to be concerned about the use of the skin later in various psychosomatic ways, as the result of a child's early experiences related to skin care.

I should not leave this subject without pointing out the individual variations in constitutions that are related to the skin, because the skin is different in so many different children. Its vascularity, its response to stimulation, its response to trauma, will not only vary from individual to individual, but will vary from time to time in the same individual. I wonder if it is not these constitutional changes and their origins that we will have to look for if we are to understand more about the original development of skin symptoms.

I was glad Dr. Kanof had a chance to talk about some of the practical side, but I think if we can have some ideas about this from the floor and any comments or critical thinking it would be appropriate at this point.

Dr. Clifford A. Webb:

I do not feel that a day passes by in the pediatrician's office that he is not faced with this problem of eczema, and I feel that anyone who does pediatrics can see how the different specialties bring themselves to a focal point within the practice of medicine. It involves the psyche of the child; it involves the skin of the child; and it also involves the infections of the child. I do not care to discredit Dr. Kanof's statements at all, but any individual who has used the allergic approach with children who have eczema can frequently relate eczema to food sensitivity. When a pediatrician suspects a certain food as being allergenic and withdraws it he often gets good results. Of course, it may be not only the withdrawal of that food but also the reassurance to the mother. Although it is true that we can not correlate our skin tests, whether they be passively transferred or direct, with the improvement of the child, we do get an improvement. I also do not feel that there is any disease that a child grows into more, instead of growing out of, than eczema, in that we have to watch out for asthma as

well as other respiratory and dermatologic allergies later on. The topical applications are certainly fine and they have worked well. I feel that it is a very hostile act to put mittens on a youngster; I feel that it is a very hostile act to use any restraint, whether it be splints or whether it be the plastic material to put over the fingernails because I feel that that brings about a great deal of emotional stress and strain on the child which can be avoided by talking with the mother and explaining the etiological factors which include food, inhalents, contact and emotional factors in the child's environment. Frequently we find eczema to be due to a combination of these factors.

Dr. Blumenthal:

Dr. Webb mentioned that foods are important in eczema. There are some well authenticated cases in which inhalants, such as dust, are important too. I would like to, now that he has spoken, rise in support of him and in slight disagreement with Dr. Kanof, that allergy plays a mininal part in eczema. As mentioned, a great many of these children will go on to develop asthma or hay fever and many of them have family histories of allergic manifestations. Dr. Kanof emphasized that these patients all recover. I believe that most of them recover, but I have seen several children who started out with eczema in infancy and just went on and on. If you are going to lead the mother to believe the child is automatically going to recover, you may be misleading her. Dr. Kanof also stressed that there was no correlation between the wheal reaction of the test and the skin reaction of eczema. Many other allergic diseases show no direct correlation with a wheal reaction, and one sometimes has to make a presumptive diagnosis, possibly through history alone and treat on that basis, but we get beneficial results. I wonder if any comment could be made on this child's coming in and dying suddenly with pneumococcal meningitis? I wonder if there is any relationship between that and this previous hormone therapy?

Dr. Howard:

I think it should be clearly stated that in the case of infantile eczema the weight of evidence indicates that the primary cause is in some way related to allergy, even though the immunologic mechanism involved is not clearly understood. I admit that any disturbance of the psyche may make an existing condition worse; certainly eczema, as Dr. Kanof pointed out, is an excellent disease for illustrating this. In the present instance, eczema certainly appears to have preceded the psychological disturbances.

I believe that the results of skin tests, especially by the passive transfer technique, are quite enough to indicate the basic allergic nature of infantile atopic eczema. In our laboratory we have shown that infants under six months of age with eczema have multiple skin sensitivities as demonstrated by the presence of passively transferable skin-sensitizing antibodies, and such results can not be obtained in like manner in the normal infant. While it is true that there cannot always, or even often, be a correlation between the results of the skin tests and the cause of the eczema, there can be no doubt whatever that these eczematous infants are vastly different immunologically from their normal counterparts.

Dr. Blumenthal has raised the question of the relationship between this child's death from pneumococcal meningitis and the previous administration of steroid hormones. While the infant received hormonal therapy during her initial visit to the hospital, there is no indication that these drugs were administered on the second admission or at home. There would appear to be no criticism of the use of steroids on the initial visit. Nevertheless, the fate of this infant emphasizes the dangers of secondary infection in eczema. In pre-antibiotic days the patient with eczema admitted to the hospital ran the risk of skin infections and bronchopneumonia, and the latter not infrequently caused the infant's demise. The risk is no less great now, either in the hospital or at home, and wherever secondary infection remains a threat, proper antibiotic coverage is a must. Other methods of handling should be exhausted before hospitalization is decided upon.

Dr. Lourie:

We can wind this up by saying that we are between Scylla and Charybdis, between the devil and the deep blue sea. We are in the business of clearing up eczema when it is presented to us in a patient, but we are in the danger of allowing the individual to go too far on the side of pain or displeasure or self-hurt or hurt from another person. On the other side, however, too much pleasure can come from being dealt with by others in terms of medication. I think we have to be very careful, when possible, not to have continual skin applications by another person because it does not matter to the child after a while who does the stroking, who does the scratching. If his mother will do it for him, that is so much the better. If we remember that too great stimulation is a possible danger in our treatment of these children, we must then think in very common-sense terms of ways in which we can keep not only the child away from these lesions on his skin, but also his mother. To accomplish this we may have to prescribe pretty rigid routines, and work out ways in which there can be fairly long intervals between application of topical medications to the lesions.

RHEUMATIC FEVER

PART III (*Concluded*)

Bernice Wedum, M.D.*
Edited by J. William Oberman, M. D.†

I want to say a few words about the care of children with rheumatic fever after they recover from the acute attack. Convalescent care remains one of the most important aspects of proper treatment. It is all too easy, after treating the acute attack, to forget about the child and let him stay home in bed.

These children should first of all be protected against streptococcal infection. As soon as a diagnosis of rheumatic fever is made, each child should receive prophylactic intramuscular penicillin in an amount of 300,000 units a day. This dose should be continued orally as soon as the child enters the convalescent phase of his illness.

You have to remember that you are not treating just a disease. You are trying to conserve the child in toto, and that includes his whole personality. It is very important that these children keep up with their schooling and lead lives that are just as normal as possible. I honestly believe that convalescent care in a well run convalescent home is better than home care. It is better for these children to be with other children their own age who are as they are and can enter into the same activities. It can be pretty miserable for the chronically ill child at home unless he has very intelligent parents. I have seen too many of these rheumatic children just lying around without an occupational therapy program or any good teaching program. One of the most important aspects of convalescent care is vocational guidance. You can not just drop these children when they reach their teens; you must see that they do not choose a vocation that will expose them to recurrences of rheumatic fever. For example, I do not think it wise for a boy to plan to be a dentist. All prophylactic therapy that you will, I still feel that working with peoples' upper respiratory tracts all day long is not the very best thing in the world for a person who has had rheumatic fever. The same applies to such occupations as theater ushers. In theaters, of course, is the element of crowds with their respiratory infections.

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From an informal talk presented to a group of Children's Hospital Residents and Howard University Medical Students. Reproduced through the kind permission of Roland B. Scott, M.D., Professor of Pediatrics, Howard University School of Medicine.

The question of competitive sports arises. I feel quite strongly that children who have had rheumatic fever ought to be allowed to do anything they wish to do. This, of course, does not include the children with severe rheumatic heart disease, certainly not mitral stenosis. These have to be restricted somewhat. The management of those with mitral insufficiency will depend on the school set-up. If you have intelligent instructors I see no reason why these children should not be allowed to take competitive sports. Sometimes you have to restrict them, not so much for what they can do to their hearts, but for what happens to them in the showers afterwards. There they are crowded together and frequently get chilled. You just have to look at these things with a certain amount of just plain horse sense and be guided accordingly.

You also can not handle a teen-age boy quite the way you can handle a teen-age girl. Teen-age girls just do not like activities. They are delighted when they do not have to take gym and that sort of thing. You can not just tell a teen-age boy that he can not do this or that; he will go out and do it anyway. I know that from experience. You have to tell them what they *can* do.

As far as marriage is concerned, the girls should be advised to wait until they are between the ages of 23 to 35 for pregnancies. I used to, in giving talks like this, go through a whole list of things I felt these people should and should not do, but I have since learned from conferring with the Department of Vocational Rehabilitation in Baltimore that the best thing to do is to start in your area and find out what jobs are available. Then sift those out that are obviously not suitable for a rheumatic child and advise him accordingly.

I have already briefly touched on prophylactic treatment of infection in these children. I think penicillin is the best agent to use, but I think it should be used correctly; none of this stopping it after the age of eighteen; none of this stopping it during the summer. Some of the most severe rheumatic fever I have ever seen has been during the summer months in Colorado.

As far as the etiology of rheumatic fever is concerned, I think the association of the streptococcus with the disease has been established, especially after Dr. Kuttner's work showing the effects of sulfonamides in the prevention of recurrences. She feels pretty definitely that prophylactic antibiotics and chemotherapy not only prevent the obvious manifestation of rheumatic fever, polyarthritis, but over a long period of time, carditis as well. Now I do not think she feels quite so strongly about these things as she does about the fact that the obvious acute recurrences are prevented. The point, of course, is that there is not much sense in preventing acute polyarthritis if underneath it all there is a carditis which is going along in spite of

the child's receiving prophylactic penicillin. However, prophylactic penicillin does seem to be working as far as carditis is concerned.

So the association with streptococcal infection is there, but what is the nature of it? We have the work of Dr. Rich on sensitivity. We know that if we give a large dose of a foreign protein to a rabbit, in the course of about two days to two weeks lesions in the myocardium which resemble Aschoff bodies will develop. Some of the recent work performed by Germuth has demonstrated that if foreign protein is given to animals previously sensitized to an antigen, these animals do not get nearly as many lesions of the myocardium as those who have been given only the initial shocking dose of antigen. Presumably, the human is sensitized initially, possibly to some streptococcal product, and when re-exposed to that product has a fulminating attack of rheumatic fever. In other words, it does appear that the streptococcus sensitized patients are more susceptible; on the other hand, in certain animals prior sensitization seems to make milder the effects of a subsequent exposure to antigen.

In Colorado we had a marvelous opportunity to study the disease in 2,500 children who were thought to have rheumatic fever. The death rate from rheumatic fever in Colorado is higher than in any other place in the United States. We became interested in the effect of altitude. We used to see the disease at Lowry Field where we saw *real* rheumatic fever in these young recruits. One of them told me that he got the disease the day after he came out of a pressure chamber. They had him up in high altitude in a pressure chamber and when he came down the next day he developed rheumatic polyarthritis. We later did a series of studies on children in Colorado living above 10,000 feet above sea level, on other children living at 5,000 feet above sea level, and later on when I came to Washington, on 4,000 children in the District of Columbia and Maryland, living at what is virtually sea level, all in an attempt to discover whether altitude had anything to do with rheumatic fever. We did not find any difference in the prevalence of the disease in the two areas; about 1 per cent in each area. The matter of severity, however, is another thing; I have a distinct impression that the disease is more severe in Colorado than it is in this area. I have never been sure that the fluctuations of barometric pressure, not the altitude, that occur in mountainous areas may not have something to do with the fact that the disease is more severe in Colorado.

Altogether, I or those who had worked with me examined 14,000 children in various parts of Colorado in an attempt to find the incidence of the disease in a naturally unselected population, and in one county we did not find a single case in over 1,000 children. Although it is not statistically significant, we all noticed that these children had remarkably good teeth in comparison with other children we had examined. There has always been a

question in my mind why this was so; incidentally, we examined the water supplies and it was not a question of fluorine.

In examining these 14,000 children in Colorado and 2,000 additional children in the District of Columbia we discovered that fully one-half of the cases we found were previously undiagnosed. The diagnosis was usually made by discovering a child with a frank mitral or aortic insufficiency. Incidentally, we also found that rheumatic polyarthritis in our series was followed in 40 per cent of the cases by definite manifestations of cardiac involvement of one kind or another.

Streptococcal disease certainly does not seem to be the whole story. Dr. Jones, for example, reported in 1935 rheumatic recurrences following typhoid infections, fractures, circumcisions, and burns. All this in addition to the fact that we saw so many cases in which we could not find any history of antecedent streptococcal infection or even a history of any rheumatic manifestation whatsoever. In many patients in whom Aschoff bodies are found as an incidental finding in the left atrial appendages following commissurotomy, there is absolutely no evidence of elevation of streptococcal antibodies in their serum which I think is an awfully interesting finding.

But I just can not believe that this disease results from streptococcal disease alone. I feel that the streptococcus certainly can initiate it and that it is the most common precipitating factor. But from the little pieces of evidence that I have given, you can see that the disease without a doubt, can occur without the preceding streptococcal infection and I have never been quite convinced that there was not a specific etiologic agent involved in the production of rheumatic fever. I have personally been interested in doing tissue culture studies on the left atrial appendages in which we have found Aschoff bodies, and have looked for evidence of a virus. The work I have done was brief and I must confess that I found nothing whatsoever. But I do think that is a point which needs further investigation. As ardent a streptococcal theory advocate as Dr. Paul is, at least during the last time I talked to him about it, he still in the back of his mind wondered about the possibility of a virus being the real agent responsible for rheumatic fever. In his original description you will grasp the point that Aschoff himself felt that the Aschoff body was a specific lesion, possibly due to a specific etiologic agent. Again, I once saw quite definite evidence of chorea develop in a child who was receiving quite adequate cortisone therapy. There again, if this is a matter of suppressing inflammatory reaction, why should a child receiving cortisone therapy develop chorea? To me that is very difficult to explain. The advocates of the streptococcal theory believe it to be an allergic encephalitis and explain it that way.

Question from the floor: What is your feeling towards the thought of some physicians that the sedimentation rate in rheumatic fever is normal

only when chorea is the major manifestation or when congestive heart failure exists?

Dr. Wedum: I know that is not true from personal experience. It is not common and I will say that the sedimentation rate will be invariably elevated in a case of frank polyarthritis but can certainly be normal with a low grade carditis.

Question: In your experience have you seen abdominal pain occur very frequently in rheumatic fever?

Dr. Wedum: I have certainly seen it, but for some reason it has not played a large part in either my Cincinnati or Colorado experience, or with my experience in this part of the country. It is undoubtedly a part of the rheumatic picture but I have not seen it as often as other people have described. I have always felt it to be one of those coincidental things. The question of appendicitis always comes up in those who have abdominal pain and I feel quite definitely that if there is any question at all, a laparotomy should be performed. An abdominal incision is not nearly so harmful as peritonitis due to a ruptured appendix.

Tonsillectomies are another matter. In general, the indications for tonsillectomy in a rheumatic child are as they are in any child except that you must be very certain that he is not in the active rheumatic state. There is no doubt that tonsillectomy can aggravate rheumatic activity if operation is performed while the child has active rheumatic fever.

Question: Did I understand you to say that you favor antibiotic protection of these children and adults throughout life?

Dr. Wedum: I do. I realize that that is a little radical, but I have seen too many recurrences of rheumatic fever in adults; fathers of families, mothers with small children, usually without any kind of insurance. These are catastrophic social problems, and I most certainly think that a couple of small pills a day is a small price to pay for protection against streptococcal infection.

It is best to advise patients to take these pills at one time, i. e., in the morning on arising rather than twice a day since the second dose can readily be omitted due to oversight.

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TRACHEOTOMY: CARE OF THE PATIENT

Joseph M. LoPresti, M.D.*

There are few dogmatic principles in the practice of medicine, but the basic concept of "maintain an open airway" is certainly one of these. Numerous lives will be preserved if medical personnel keep this principle always in the foreground as they care for patients regardless of their basic illness.

Tracheotomy is an extraordinary measure provided for the maintenance of an open airway; its primary purpose is to insure adequate ventilation. Basically, tracheotomies are performed for one of two reasons or a combination of these: 1) to bypass an obstruction in the upper portion of the air passage; 2) to keep the lower portion of the tracheobronchial tree free of mucus obstruction.

There are no steadfast rules which determine the optimal time for performing a tracheotomy. The decision to operate must, of necessity, depend on clinical experience and judgment. However, it is a reflection of poor medical judgment if the procedure is forestalled until the late signs of cyanosis and/or exhaustion intervene. The patient must be observed

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closely for clinical manifestations of inadequate ventilation. When signs of hypoxia appear and ordinary therapeutic measures prove ineffectual, a tracheotomy is indicated. When in doubt, it is a wiser and safer decision to perform a tracheotomy. There is no greater tragedy than to discover at the autopsy table that a tracheotomy would have been life-saving.

The physician should be cognizant of the more important physiological effects that this surgical procedure produces in his patient. This knowledge has important therapeutic implications. From the patient's standpoint, the most outstanding feature is the loss of the ability to vocalize, since he cannot force air past the vocal cords. After respiration is established through the tracheal stoma, the disruption of established, unconscious reflexes results in additional phenomena: 1) respiration becomes, for a time, a conscious effort; and, 2) the act of swallowing which is so closely integrated with breathing is initially impaired and must be relearned.

The physician-patient, and nurse-patient relationship has some bearing on ultimate prognosis and morbidity. The psychic trauma of a tracheotomy and its impact on the patient should be recognized and considered. Whenever it is possible, the patient should be prepared for the eventuality of surgery. If this can be accomplished, the reasons for and the effects of the operation should be discussed with the patient beforehand. Of course, the explanations are attuned to his ability to understand. Such pre-operative preparation acts as a shock absorber and allays undue anxiety. It establishes a foundation for patient rapport and cooperation. A cooperative patient receives better medical care, e.g., a well adjusted patient with a tracheotomy will indicate when aspiration is needed. A considerate doctor and nurse can act to abort dependence on the tracheotomy and thus, make possible earlier removal of the tube. It also will be possible to institute oral feeding much sooner. Sir William Osler stressed the importance of equanimity as a virtue to be cultivated in all members of the medical profession. There is no situation in which a calm and self confident attitude is needed more. If the patient senses that the doctor and nurses are competent, he will rest more easily; this rest is one of the most valuable therapeutic tools.

After the surgery has been performed, constant nursing attendance is an essential feature for adequate care and should be provided by experienced nurses. If these are not available, every nurse attending the patient must be well instructed in all details of proper care. An increased atmospheric humidity is preferable. This may be produced by any suitable apparatus. Increased humidity has the advantages of liquefying secretions and preventing desiccation of mucous membranes. Atropine and atropine-like drugs should not be used. While they will curtail the production of tracheobronchial secretions, they also will cause these secretions to become so tenacious that the formation of mucous plugs will be enhanced and aspiration will be

difficult. Opiates are contraindicated. It is foolhardy to administer a drug which depresses respiration to a patient in whom aeration is of vital importance.

The strings holding the cannula in place must be checked frequently to insure that they are sufficiently tight to prevent the cannula from coming out of the trachea as the tissues swell. The inner cannula should be removed and cleaned, preferably twice a day, to prevent it from becoming obstructed by crusted secretions. The most important phase of the care is the aspiration of the outer cannula and the tracheobronchial tree as often as is necessary to maintain an open airway. Nurses should be instructed in detail in the actual technique of suctioning through a tracheal stoma. They should be scrupulously clean to avoid introducing secondary infection. The catheters must be changed frequently and, when not in use, kept in a sterile solution. Nasal catheters should be separated from those used to aspirate the tracheobronchial tree and *never* interchanged. The nurse is instructed to wash her hands before proceeding to suction the patient.

It is essential that unnecessary trauma to the mucous membranes of the respiratory tree be avoided. For this reason a soft, rubber catheter with a whistle tip is superior to a stiff plastic tube. In addition, if a "Y" tube is installed between the catheter and the suction machine, control of the vacuum pressure will be at the fingertip of the operator. Occlusion of the open end of the "Y" will apply negative pressure; releasing it will stop the suction immediately. Should the catheter "grab" at the mucous membrane, the "Y" valve is used to release suction and prevent membrane damage.

The initial step is to remove the inner cannula. The outer cannula and upper trachea are then aspirated clear of secretions. After clearing the upper airway the catheter is inserted to maximal depth with the "Y" valve open. The catheter is then pulled back about one centimeter to free the tip from the bronchial wall, and aspiration is performed by occluding the "Y" valve with the tip of a finger. The catheter is removed slowly and gently, at the same time being rotated 360°. Prolonged continuous suctioning must be avoided. For this reason each aspiration is limited to 15 seconds and, whenever possible, a three minute rest period is allowed between aspirations[1]. The catheter should be flushed out frequently with sterile water to keep it open. It is beneficial to instill a few drops of sterile saline into the trachea prior to aspiration since this renders the secretions more liquid and, thus, more easily removable. Deep suctioning is essential if an adequate airway is to be maintained. It is possible to pass the catheter into the main stem bronchi simply by turning the patient's head to the right to aspirate the left bronchus and in the opposite direction to aspirate the right bronchus. The accumulation of secretions in the smaller bronchioles and alveoli also must be minimized for adequate ventilation. The patient should be encouraged to cough frequently, prior to, during, and between aspirations.

No amount of aspiration will be beneficial if the symptoms of the inadequate ventilation are unrecognized. Constant vigilance for the physical signs of even mild degrees of hypoxia is an integral part of management. Cyanosis is a late sign of insufficient aeration, but increasing dyspnea, and a rising pulse rate are usually early signs. The most important and easily recognizable feature of hypoxia is restlessness. To the experienced physician the appearance of restlessness in the patient with a tracheotomy is the most important warning signal of impending danger. When one or more of these manifestations of hypoxia occur, careful evaluation and vigorous aspiration are indicated. Bronchoscopy may be necessary if these measures do not relieve the distress.

When symptoms of inadequate ventilation appear, they may indicate the development of a complication. The most frequent of these is the occurrence of numerous small plugs of mucus in the smaller bronchial branches. Usually these plugs are removed easily by aspiration. The most important and serious complication is massive atelectasis caused by a plug of mucus occluding one of the main stem bronchi. This complication may occur without any change in the respiratory rate, and the only sign may be peripheral vascular collapse. Aspiration may remove the plug but bronchoscopy is frequently necessary. A further, not unusual, complication of tracheotomy is the development of mediastinal emphysema and pneumothorax. These conditions are produced when the surgeon inadvertently punctures the apical pleura while performing the tracheotomy. The early recognition and proper treatment of a tension pneumothorax may prevent a fatal outcome. It is recommended that following the operation, the patient with a tracheotomy be examined by fluoroscopy and/or an x-ray of the chest be taken as a routine measure. This is particularly true in those patients who are not relieved by a tracheotomy.

Essential to the welfare of the patient with a tracheotomy is complete rest; unnecessary disturbance should be avoided. Intelligent neglect is to be preferred to constant administrations by an over-indulgent nurse. The proper care of the tracheotomy wound is also a matter of "leave well enough alone". It is sufficient to keep the operative site covered with sterile gauze pads split halfway down the middle and inserted under the outer lip of the tracheotomy tube. These are held in place by the strings which keep the cannula *in situ*. A small amount of post-operative oozing of blood is to be expected and should cause no concern. However, an undue amount of hemorrhage requires investigation and appropriate therapeutic measures. Antibiotics are administered routinely to prevent secondary infections. These may be employed also to combat a primary infection, e.g., acute laryngotracheobronchitis.

In the convalescent stage, dependence of the patient on his tracheotomy should be discouraged. The aim should be an early return to normal physio-

logic function. Oral feeding should be instituted as soon as possible, albeit slowly. As the patient improves and the need for aspiration becomes less frequent, the tracheal stoma may be occluded gradually over a period of days by using adhesive tape to obliterate the opening in the cannula. Finally, the opening may be plugged with a cork and if this is well tolerated for a two or three day period, removal of the cannula may be considered. No surgical closure is necessary; the wound is allowed to heal under a well applied surgical dressing.

In conclusion, it should always be remembered that the primary purpose of the tracheotomy is to maintain an open airway and insure adequate ventilation. All of the measures which are designed to insure the attainment of this purpose are indicated and instituted; those which are detrimental and defeat this aim are contraindicated and avoided.

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EPIDERMOIDOMAS (CHOLESTEATOMAS)

Diagnostic X-ray Brief

Isidore Lattman, M.D.*
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Epidermoidomas (cholesteatomas) are seen occasionally in the pediatric age group and are included among those lesions which produce defects in the calvarium. They should not be confused with cholesterosis of the temporal bone (cholesteatomas) which are usually associated with chronic suppuration of the middle ear and sclerosis and hypoplasia of the mastoid process.

The epidermoidomas are ectodermal rests or inclusions which may be located in the scalp, in the diploic spaces, or between the internal surface of the inner table and the dura. They usually affect the frontal area of the skull.

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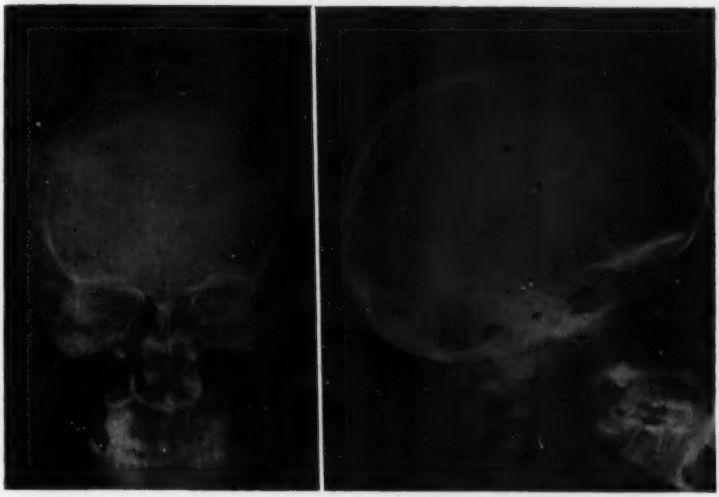

FIG. 1. AP and lateral views of the skull show a sharply demarcated shadow of diminished density with a smooth sclerotic border (arrows) in the right parietal bone. This represents a characteristic epidermoidoma (cholesteatoma).

Epidermoidomas may occur in infants as well as older children. They are usually benign, single, and asymptomatic. A palpable soft tissue mass of varying size may be the only finding. Frequently, the diagnosis is made when the skull is x-rayed for some unrelated reason, e.g., trauma. Rarely, the lesion protrudes into the cranial cavity and produces cerebral symptoms.

The roentgenographic changes are typical. The tumor grows and impinges on the calvarium and produces local erosion of the bone. This appears as a sharply demarcated shadow of diminished density with a smooth sclerotic border (Figure 1). This border is caused by flaring of the edge of the bone into a marginal ridge. It is this sclerotic halo which is pathognomonic of an epidermoidoma. When this sclerotic margin is not present, an eosinophilic granuloma or one of the other reticuloendothelioses should be kept in mind.

Surgical extirpation of the lesion is the indicated treatment if symptoms are disturbing enough.

A review of the American medical literature discloses 3 cases of epidermoidomas in childhood which in later adult life were found to be malignant squamous cell carcinomas. In view of this fact, it might be well to consider epidermoidomas as potentially malignant lesions which should be totally excised at the earliest feasible time.

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